

Please type a plus sign (+) inside this box

PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

OCT 01 2001

Complete if Known

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 1 of 2

Application Number	09/826,583
Filing Date	04/06/01
First Named Inventor	Marc A. Unger
Group Art Unit	1772
Examiner Name	Unassigned
Attorney Docket Number	20174-003010US

RECEIVED
OCT 4 2001
TC 1700

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
APR	1	6,174,365	B1	Sanjoh	01-16-2001	
	2	6,007,309		Hartley	12-28-1899	
	3	5,876,187		Afromowitz et al.	03-02-1899	
	4	5,836,750		Cabuz	11-17-1898	
	5	5,759,014		Van Lintel	08-02-1898	
	6	5,705,018		Hartley	01-08-1898	
	7	5,659,171		Young et al.	08-19-1897	
	8	5,529,465		Zengerle et al.	06-25-1896	
	9	5,376,252		Ekstrom et al.	12-27-1894	
	10	5,375,979		Trah	12-27-1894	
	11	5,338,062		Richter	08-09-1894	
	12	5,265,327		Faris et al.	11-30-1893	
	13	5,259,737		Kamisuki et al.	11-09-1893	
	14	5,224,843		Van Lintel	07-06-1893	
	15	5,171,132		Miyazaki et al.	12-15-1892	
	16	5,096,388		Weinberg	03-17-1892	
	17	5,085,562		Van Lintel	02-04-1892	
	18	4,153,855		Feingold	05-08-1879	
	19	4,119,368		Yamazaki	10-10-1878	



RECEIVED
OCT 4 2001
TC 100

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	100
		Office ³	Number ⁴	Kind Code ⁵ (if known)				
Amo	20	WO	99/17093	A1		04-08-1999		
	21	WO	98/07069	A1		02-19-1998		
	22	EP	999 055	A2		10-05-2000		
	23	EP	845 603	A1		06-03-1998		
	24	EP	829 360	A2		03-18-1998		
	25	EP	779 436	A2		06-18-1997		
	26	EP	706 004	A2		04-10-1996		
	27	EP	703 364	A1		03-27-1996		
	28	EP	592 094	A2		04-13-1994		
	29	GB	2 308 460	A		06-25-1997		
	30	GB	2 155 152	A		09-18-1985		

Examiner Signature	Amo	Date Considered	Oct 04
--------------------	-----	-----------------	--------

¹ EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Please type a plus-sign (+) inside this box → +

OCT 01 2001

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet

1

of

3

Complete If Known

Application Number	09/826,583
Filing Date	04/06/01
First Named Inventor	Marc A. Unger
Group Art Unit	1772
Examiner Name	Unassigned

Attorney Docket Number

20174-003010US

RECEIVED
OCT 1 2001
TCA
2001

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
AMU	31	Brechtel et al., "Control of the electroosmotic flow by metal-salt-containing buffers," <u>J Chromatography A</u> , 716:97-105 (1995).	
7	32	Bryzek et al., "Micromachines on the march," <u>8045 IEEE Spectrum</u> , 31(5):20-31 (1994). XP 000456261	
	33	Buchaillet et al., "Silicon Nitride Thin Films Young's Modulus Determination by an Optical Non-Destructive Method," <u>Ipn. J. Appl. Phys.</u> , 36 Pt. 2(6B):L794-L797 (1997).	
	34	Chiu et al., "Patterned deposition of cells and proteins onto surfaces by using three-dimensional microfluidic systems", <u>PNAS</u> , 97(6):2408-2413 (2000).	
	35	Chou et al., "A microfabricated device for sizing and sorting DNA molecules," <u>PNAS</u> , 96:11-13 (1999).	
	36	Delamarche et al., "Patterned Delivery of Immunoglobulins to Surfaces Using Microfluidic Networks," <u>Science</u> , 276:779-781 (1997).	
	37	Duffy et al., "Rapid Prototyping of Microfluidic Systems in Poly(dimethylsiloxane)", <u>Analytical Chemistry</u> , 70(23):4974-4984 (1998).	
	38	Duffy et al., "Rapid prototyping of microfluidic switches in poly(dimethyl siloxane) and their actuation by electro-osmotic flow," <u>J. Micromech. Microeng.</u> , 9:211-217 (1999).	
	39	Duffy et al., "Patterning Electroluminescence Materials with Feature Sizes as Small as 5µm Using Elastomeric Membranes as Masks for Dry Lift-Off," <u>Advanced Materials</u> , 11(7):546-552 (1999) XP-000849014	
	40	Effenhauser et al., "Integrated capillary electrophoresis on flexible silicone microdevices: Analysis of DNA restriction fragments and detection of single DNA molecules on microchips," <u>Anal. Chem.</u> , 69:3451-3457 (1997).	
	41	Effenhauser et al., "Integrated chip-based capillary electrophoresis," <u>Electrophoresis</u> , 18:2203-2213 (1997).	
	42	Fahrenberg et al., "A microvalve system fabricated by thermoplastic molding," <u>J. Micromech. Microeng.</u> , 5:169-171 (1995).	
	43	Fu et al., "A microfabricated fluorescence-activated cell sorter," <u>Nature Biotechnology</u> , 17:1109-1111 (1999).	
	44	Goll et al., "Microvalves with bistable buckled polymer diaphragms," <u>J. Micromech. Microeng.</u> , 6:77-79 (1996).	
	45	Graveson et al., "Microfluidics—a review", <u>J. Micromech. Microeng.</u> , 3:168-182 (1993).	
	46	Harrison et al., "Micromachining a miniaturized capillary electrophoresis-based chemical analysis system on a chip," <u>Science</u> , 261:895-897 (1993).	
AMU	47	Hornbeck et al., "Bistable Deformable Mirror Device," <u>Spatial Light Modulators and Applications 1988 Technical Digest Series, Volume 8</u> , Postconference Edition, Summaries of papers presented at the Spatial Light Modulators and Applications Topical Meeting, June 15-17, 1988, Optical Society of America, pgs. 107-110.	

44152

RECEIVED
OCT 4 2001
JCT 1700

JMC	48	Hosokawa et al., "Handling of Picoliter liquid samples in a poly(dimethylsiloxane)-based microfluidic device," <i>Anal. Chem.</i> , 71(20):4781-4785 (1999).	
	49	Ikuta et al., "Three dimensional micro integrated fluid systems (MIFS) fabricated by st ^{ere} o lithography," <i>IEEE Kyushu Institute of Technology</i> , pgs. 1-6 (1994).	
	50	Jacobson et al., "High-speed separations on a microchip," <i>Anal. Chem.</i> , 66(7):1114-1118 (1994).	
	51	Jacobson et al., "Microfluidic devices for electrokinetically driven parallel and serial mixing," <i>Anal. Chem.</i> , 71(20):4455-4459 (1999).	
	52	Jung et al., "Chemical and Physical Interactions at Metal/Self-Assembled Organic Monolayer Interfaces," <i>Crit. Rev. Solid State Material Sciences</i> , 19(1):2-10 (1994) XP000955639	
	53	Kenis et al., "Microfabrication inside capillaries using multiphase laminar flow patterning," <i>Science</i> , 285:83-85 (1999).	
	54	Kopp et al., "Chemical Amplification: Continuous-Flow PCR on a Chip", <i>Science</i> , 280:1046-1048 (1998).	
	55	Kuhn et al., "Silicon Charge Electrode Array for Ink Jet Printing", <i>IEEE Transactions on Electron Devices</i> , ED-25(10):1257-1260 (1978).	
	56	Lin et al., "Free-space micromachined optical switches for optical networking," <i>IEEE J. Selected Topics in Quantum Electronics</i> , 5(1):4-9 (1999).	
	57	Lötters et al., "The mechanical properties of the rubber elastic polymer polydimethylsiloxane for sensor applications," <i>J. Micromech. Microeng.</i> , 7:145-147 (1997).	
	58	Lucy et al., "Characterization of the cationic surfactant induced reversal of electroosmotic flow in capillary electrophoresis," <i>Anal. Chem.</i> , 68:300-305 (1996).	
	59	Maluf, N., <i>An Introduction to Microelectromechanical Systems Engineering</i> , Artech House Publishers, Boston London pages 42-45.	
	60	Markx et al. "Applications of dielectrophoresis in biotechnology," <i>Tibtech</i> , 15:426-432 (1997).	
	61	Muller et al., "Surface-micromachined microoptical elements and systems," <i>Proceedings of IEEE</i> , 86(8):1705-1720 (1998).	
	62	Qin et al., "Elastomeric Light Valves" <i>Advanced Materials</i> , 9(5):407-410 (1997) XP-000683891	
	63	Qin et al., "Photolithography with transparent reflective photomasks," <i>J. Vac. Science and Technology</i> , 16(1):98-103 (1998) XP00213356	
	64	Rapp, R., "LIGA micropump for gases and liquids," <i>Sensors and Actuators A</i> , 40:57-61 (1994).	
	65	Roylance et al., "A Batch-Fabricated Silicon Accelerometer", <i>IEEE Transactions on Electron Devices</i> , ED-26(12):1911-1917 (1979).	
	66	Schasfoort et al., "Field-effect flow control for microfabricated fluidic networks," <i>Science</i> , 286:942-945 (1999).	
	67	Schueler et al., "Fabrication of glassy carbon microstructures by soft lithography," <i>Sensors and Actuators A</i> , 72(2):125-139 (1999) XP004155654	
	68	Shoji, S., "Fluids for Sensor Systems", <i>Topics in Current Chemistry</i> , 194:162-188 Springer Verlag Berlin Heidelberg (1998).	
	69	Smits, J.G., "Piezoelectric Micropump with Three Valves Working Peristaltically", <i>Sensors and Actuators</i> , A21-A23:203-206 (1990).	
	70	Tufte et al., "Silicon diffused-element piezoresistive diaphragms," <i>J. Appl. Phys.</i> , 33(11):3322-3327 (1962).	
	71	Van der Pol et al., 'Micro Liquid Handling Devices - A Review", <i>Micro Systems Technologies</i> , 90:799-805 (1990).	
JMC	72	Washizu et al., "Molecular dielectrophoresis of biopolymers," <i>IEEE Transactions on Industry Applications</i> , 30(4):835-843 (1994).	

8/12/04

<i>Done</i>	73	Xia et al., "Complex optical surfaces formed by replica molding against elastomeric masters," <u>Science</u> , 273:347-349 (1996).	
	74	Xia et al., "Soft Lithography," <u>Angew. Chem. Int. Ed.</u> 37:551-575 (1998).	
	75	Xia et al., "Micromodeling of Polymers in Capillaries: Applications in Microfabrication," <u>Chemistry of Materials</u> , 8(7):1558-1567 (1996) XP000626885	
	76	Yang et al., "A Mems Thermopneumatic Silicone Membrane Valve", Proceedings of IEEE 10 th Annual International Workshop on MicroElectro Mechanical Systems, Sensors and Actuators, A64(1):101-108 (1998).	
	77	Yazdi et al., "Micromachined inertial sensors," <u>Proceedings of IEEE</u> , 86(8):1640-1659 (1998).	
	78	Young et al., "Contoured elastic-membrane microvalves for microfluidic network integration," <u>J. Biomechanical Engineering</u> , 121:2-6 (1999).	
<i>Done</i>	79	XP-002149046, Ullmann's Encyclopedia of Industrial Chemistry, Sixth Edition, 1999 Electronic Release, 6 pages.	

Examiner Signature	<i>On</i>	Date Considered	11/12/04
--------------------	-----------	-----------------	----------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.
PA 3173007 v1

+



PTO/SB/08B (10-01)

Approved for use through 10/31/2002. OMB 0651-0031
ent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet

2 of 2

Substitute for form 1449B/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Application Number	09/826,583
		Filing Date	April 6, 2001
		First Named Inventor	Unger et al.
		Art Unit	3753
		Examiner Name	Chambers, A.M.
(use as many sheets as necessary)		Attorney Docket Number	
Sheet	2	of	2
20174C-003010US			

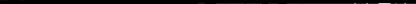
OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>AG</i>	AG	Quake et al., "From Micro- to Nanofabrication with Soft Materials," <u>Science</u> , 290:1536-1540 (2000).	
<i>AH</i>	AH	Unger et al., "Monolithic Microfabricated Valves and Pumps by Multilayer Soft Lithography," <u>Science</u> , 288:113-116 (2000).	
<i>AI</i>	AI	Van de Pol et al., "A Thermo-Pneumatic Actuation Principle for A Microminiature Pump and Other Micromechanical Devices," <u>Sensors and Actuators</u> , 17:139-143 (1989)	

RECEIVED

FEB 04 2003

TC 1700

Examiner Signature		Date Considered	11/12/04
--------------------	---	-----------------	----------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PA 3278502 v1

APR 16 2004

PTO/SB/08A (08-03)

<p>Substitute for form 1449A/PTO <i>SEARCH & TRADEMARK</i></p> <p>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p><i>(use as many sheets as necessary)</i></p>		Complete If Known	
		Application Number	09/826,583
		Filing Date	April 6, 2001
		First Named Inventor	Marc A. Unger
		Art Unit	3753
		Examiner Name	Michael A. Chambers
Sheet	1	of	1
		Attorney Docket Number	
		20174C-003010US	

U.S. PATENT DOCUMENTS+

FOREIGN PATENT DOCUMENTS

Examiner Signature		Date Considered	11/12/04
--------------------	---	-----------------	----------

¹EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ²Applicant's unique citation designation number (optional). ³Kind Codes of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ⁴Enter Office that Issued the document, by the two-letter code (WIPO Standard ST.3). ⁵For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁶Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

60177392v1